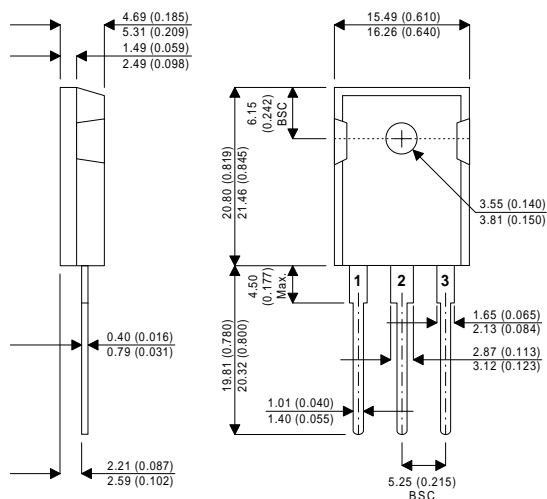


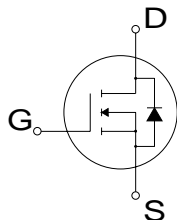
TO-247AD Package Outline.
Dimensions in mm (inches)



Pin 1 – Gate

Pin 2 – Drain

Pin 3 – Source



**N-CHANNEL
ENHANCEMENT MODE
HIGH VOLTAGE
POWER MOSFETS**

V_{DSS} 500V
 $I_{D(cont)}$ 22A
 $R_{DS(on)}$ 0.240Ω

- **Faster Switching**
- **Lower Leakage**
- **100% Avalanche Tested**
- **Popular TO-247 Package**

StarMOS is a new generation of high voltage N-Channel enhancement mode power MOSFETs. This new technology minimises the JFET effect, increases packing density and reduces the on-resistance. StarMOS also achieves faster switching speeds through optimised gate layout.

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

| | | | |
|----------------|--|------------|------|
| V_{DSS} | Drain – Source Voltage | 500 | V |
| I_D | Continuous Drain Current | 22 | A |
| I_{DM} | Pulsed Drain Current ¹ | 88 | A |
| V_{GS} | Gate – Source Voltage | ±20 | V |
| V_{GSM} | Gate – Source Voltage Transient | ±30 | |
| P_D | Total Power Dissipation @ $T_{case} = 25^{\circ}C$ | 280 | W |
| | Derate Linearly | 2.24 | W/°C |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to 150 | °C |
| T_L | Lead Temperature : 0.063" from Case for 10 Sec. | 300 | |
| I_{AR} | Avalanche Current ¹ (Repetitive and Non-Repetitive) | 22 | A |
| E_{AR} | Repetitive Avalanche Energy ¹ | 30 | mJ |
| E_{AS} | Single Pulse Avalanche Energy ² | 1210 | |

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.

2) Starting $T_J = 25^{\circ}C$, $L = 5.0mH$, $R_G = 25\Omega$, Peak $I_L = 22A$

STATIC ELECTRICAL RATINGS ($T_{case} = 25^{\circ}C$ unless otherwise stated)

| | Characteristic | Test Conditions | Min. | Typ. | Max. | Unit |
|--------------|--|--|------|------|-----------|----------|
| BV_{DSS} | Drain – Source Breakdown Voltage | $V_{GS} = 0V, I_D = 250\mu A$ | 500 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current ($V_{GS} = 0V$) | $V_{DS} = V_{DSS}$ | | | 25 | μA |
| | | $V_{DS} = 0.8V_{DSS}, T_C = 125^{\circ}C$ | | | 250 | |
| I_{GSS} | Gate – Source Leakage Current | $V_{GS} = \pm 30V, V_{DS} = 0V$ | | | ± 100 | nA |
| $V_{GS(TH)}$ | Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 1.0mA$ | 2 | | 4 | V |
| $I_{D(ON)}$ | On State Drain Current ² | $V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max $V_{GS} = 10V$ | 22 | | | A |
| $R_{DS(ON)}$ | Drain – Source On State Resistance ² | $V_{GS} = 10V, I_D = 0.5 I_D [Cont.]$ | | | 0.24 | Ω |

DYNAMIC CHARACTERISTICS

| | Characteristic | Test Conditions | Min. | Typ. | Max. | Unit |
|--------------|--------------------------------|-----------------------------------|------|------|------|------|
| C_{iss} | Input Capacitance | $V_{GS} = 0V$ | | 3400 | | pF |
| C_{oss} | Output Capacitance | $V_{DS} = 25V$ | | 470 | | |
| C_{rss} | Reverse Transfer Capacitance | $f = 1MHz$ | | 180 | | |
| Q_g | Total Gate Charge ³ | $V_{GS} = 10V$ | | 138 | | nC |
| Q_{gs} | Gate – Source Charge | $V_{DD} = 0.5 V_{DSS}$ | | 19 | | |
| Q_{gd} | Gate – Drain (“Miller”) Charge | $I_D = I_D [Cont.] @ 25^{\circ}C$ | | 65 | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{GS} = 15V$ | | 11 | | ns |
| t_r | Rise Time | $V_{DD} = 0.5 V_{DSS}$ | | 10 | | |
| $t_{d(off)}$ | Turn-off Delay Time | $I_D = I_D [Cont.] @ 25^{\circ}C$ | | 44 | | |
| t_f | Fall Time | $R_G = 1.6\Omega$ | | 7 | | |

SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS

| | Characteristic | Test Conditions | Min. | Typ. | Max. | Unit |
|----------|------------------------------------|--|------|------|------|---------|
| I_S | Continuous Source Current | (Body Diode) | | | 22 | A |
| I_{SM} | Pulsed Source Current ¹ | (Body Diode) | | | 88 | |
| V_{SD} | Diode Forward Voltage ² | $V_{GS} = 0V, I_S = -I_D [Cont.]$ | | | 1.3 | V |
| t_{rr} | Reverse Recovery Time | $I_S = -I_D [Cont.], di_S / dt = 100A/\mu s$ | | 415 | | ns |
| Q_{rr} | Reverse Recovery Charge | $I_S = -I_D [Cont.], di_S / dt = 100A/\mu s$ | | 6.6 | | μC |

THERMAL CHARACTERISTICS

| | Characteristic | Min. | Typ. | Max. | Unit |
|-----------------|---------------------|------|------|------|---------------|
| $R_{\theta JC}$ | Junction to Case | | | 0.45 | $^{\circ}C/W$ |
| $R_{\theta JA}$ | Junction to Ambient | | | 40 | |

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.

2) Pulse Test: Pulse Width < 380 μs , Duty Cycle < 2%

3) See MIL-STD-750 Method 3471



CAUTION — Electrostatic Sensitive Devices. Anti-Static Procedures Must Be Followed.